ASSOCIATION OF SOCIO-DEMOGRAPHIC AND NUTRITIONAL FACTORS ASSOCIATED WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

SHORT SYNOPSIS

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Certificate

I hereby declare that the short synopsis **"Association of Socio-Demographic and Nutritional Factors with Chronic Obstructive Pulmonary Disease (COPD)"** being submitted in partial fulfillment of the requirement for the degree of Doctor of Philosophy in Nutrition and Dietetics under School of Allied Health Sciences of Manav Rachna International Institute of Research and Studies, Faridabad during the academic year 2022-2023.

It is a bona fide record of original work carried out under the supervision of Dr. Pratibha Singh, Professor, Department of Nutrition and Dietetics, School of Allied Health sciences and has not been submitted in full or part to any other university or institute for degree or diploma. Further, it is certified that short synopsis is plagiarism free and proof has been submitted.

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ABSTRACT

The present study aims to assess the Association of Socio-Demographic and Nutritional factors with Chronic Obstructive Pulmonary Disease (COPD) in Delhi NCR region. A cross-sectional prospective exploratory study design will be used to determine whether socio-demographic factors like age ,sex ,socio-economic status, BMI, family history and nutritional factors-carbohydrates, protein, fat, fibre and vitamin C act as significant determinants and correlates in the functional outcomes of COPD. A survey questionnaire comprising of battery of assessment tools will be administered to the selected sample based on pre-determined inclusion and exclusion criteria. The data collected will be evaluated by using appropriate statistical tools. The study will have an array of outcomes that may serve as guidelines for preventing and managing COPD and thus, improving the overall health status and quality of life of COPD patients.

Key words: Chronic Obstructive Pulmonary Disease, Lifestyle factors, Smoking, Fibre, Body Mass Index.

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1. INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is believed to be an important cause of mortality and morbidity worldwide (Jindal et al., 2001). COPD is a non communicable respiratory disease, affecting approximately 300 million people (nearly 4% of the population) and the 3rd major cause of death worldwide (Meghji et al., 2021). It was found in 2017 that out of the total death from Chronic Respiratory Diseases, 81.7% were from COPD (Li et al., 2020). Lifestyle changes, diet, smoking etc. According to the prevalence of COPD in different countries, India occupies the top most position. The main reason of delay in the diagnosis is that it progresses slowly and the symptoms appears at advance stages of disease. The mortality and morbidity rates in India are significantly impacted by the prevalence of COPD, which ranges from 3-8% in males and 2.5-4.5% among females. The disease takes second place in its incidence after Pulmonary Tuberculosis in Indian subcontinent (Jindal et al., 2001). COPD is attributed to high death rates, early deaths and substantial cost on health-care system. For the year 2020, Global Initiative for Obstructive Lung Disease (GOLD) estimates suggested that it will be the 3rd main reason of death world over as well as the 5th most prominent cause of years lost due to early deaths (Guide to COPD diagnosis, 2017).

The progress of COPD is attributed to the combination of factors such as genetics, lifestyle factors etc. Although, smoking is the single major risk factor for the development of COPD, only 20 % of the smokers eventually develop COPD. It is therefore, important that nutritional, socio demographic and lifestyle factors other than smoking may also be studied in understanding the onset and exacerbation of COPD (Holger et al., 2001). Some of the risk factors associated with the development of COPD include genetic constitution, age, tobacco smoke, childhood respiratory infections, socioeconomic status and nutrition .

COPD DEFINITION

As per WHO "Chronic Obstructive Pulmonary Disease (COPD) is a lung disease characterized by chronic obstruction of the lung airflow that interferes with normal breathing and is not fully reversible" (Gao et al., 2015).

According to the American Thoracic Society, COPD is characterized by the presence of lung airflow obstruction brought up by emphysema or chronic bronchitis and are often progressive. Airways hyperactivity and air flow blockage may be partially reversible (Wright et al., 2016).

ETIOLOGY AND RISK FACTORS ASSOCIATED WITH COPD

Various etiological and risk factors associated with COPD includes -

i) **Tobacco smoke:** Tobacco smoking has been identified as the leading cause of COPD globally. Tobacco smoke consumed in the form of cigarettes, pipes, cigar, hukka etc. obstructs airways and lung alveoli. This reduces the capacity of lungs to stretch and expand. As a result, the alveoli become thick, chronically inflamed and swollen. Production of phlegm leads to clogging of alveoli and partial / complete blockage of airflow resulting in COPD symptoms.

ii) **Demographic factors:** Age , gender and socioeconomic status are known to be associated with COPD.

iii) **Childhood respiratory infections:** Clinical history of gestational abnormalities, poor lung growth, recurrent childhood respiratory infections and diseases also increases the risk of COPD.

iv) **Genetic (Hereditary) factor:** Family history of COPD, other respiratory diseases, particular type of blood group and malignant lung conditions also predisposes a person to COPD. Besides, a hereditary disorder, Alpha-1 Anti Trypsin (AAT) deficiency has been known to increase the risk of onset of COPD.

v) **Diet and Nutrition:** Dietary habits of a person also seem to influence the development and management of COPD cases.

SYMPTOMS Of COPD

COPD is usually asymptomatic in early stages of onset. As the disease condition worsen due to continuous exposure to risk factors, the following symptoms appear in the patient:-

i) A long standing cough with or without expectoration.

ii) Difficulty in breathing on exertion (later on, there may be difficulty while sitting).

iii) Wheezing and Constricted feeling in the chest.

DIAGNOSIS OF COPD

The diagnosis of COPD is done with a detailed case taking, medical history, symptomatic analysis and history of exposure to risk factors. Spirometry is considered essential to establish the diagnosis and measure the extent and severity of airflow obstruction. The Table below shows the airflow limitation severity in COPD patients based on Spirometry Findings.

Post-Bronchodilator FEV_1 / FVC < 0.70where

FEV1 – Forced Expiratory Volume in 1 sec

FVC – Forced Vital capacity

Table 1: Airflow limitation Severity in COPD Patients.

Airflow Limitation Severity based on Post-bronchodilator FEV_1 / FVC <0.70 OR FEV_1 greater than or equal to 80 % predicted.		
GOLD 1	Mild	FEV_1 greater than or equal to 80 % predicted
GOLD 2	Moderate	FEV_1 between 50% to 80 % predicted
GOLD 3	Severe	FEV_1 between 30% to 50 % predicted
GOLD 4	Very Severe	FEV_1 less than or equal to 30 % predicted

2. LITERATURE REVIEW

Study done to examine the correlation between dietary fibre intake, lung performance and COPD. The study was done on 11,897 men and women, taken from another study (prospective study, Atherosclerosis Risk in Communities). The subjects of the study, taken from four US communities were majorly African-American or American, men and women between the age of 44 years to 66 years. The study members were firstly interviewed at their homes and then called for a standard clinical examination (spirometry), during which lung function variables were collected. The results of these along with the dietary data collected during home interviews were used for the cross-sectional analysis. The diet intake of the subjects for the last one year was evaluated using a partially-quantifiable, FFQ (food frequency questionnaire), conducted by trained interviewers. Information regarding frequency of consumption of a particular food item, the range being taken as never to ≤ 1 time per month and up to ≥ 6 times a day. The overall daily nutrient intake along with the total amount of daily fibre were calculated for each subject. Also, BMI for each subject was calculated using weight (Kg) / height (m^2) formula. Through the interviews, information such as age, sex, gender, ethnicity, occupation, education, smoking, exposure to environmental tobacco smoke, medical history etc. was also gathered. For smoking history, the subjects were also classified into never smokers, former smokers and current smokers. A reduction in COPD related symptoms and death was observed in the analysis, coupled with a positive link between high fibre intake (from dietary sources like cereals, vegetables and fruits) and improved lung functions. Also, it was discovered during the data analysis that the positive benefits of high fibre intake were unaffected by the quantity of other nutrients like ascorbic acid, tocopherol, Vitamin D, omega-3 fatty acids etc. or by a reduction in the consumption of cured meat. By this study, it was also discovered that compared to vegetable fibre, cereal and fruit fibre had a better physiological effects that helps to improve the respiratory system, hence improving lung function (Hanson et al., 2016).

In another prospective cohort study conducted by Varraso et al. the researchers examined 111580 nurses and health professionals to study the connection between the intake of dietary fibre and occurrence of respiratory diseases with special emphasis on its effect. This study also included 832 persons with recently diagnosed COPD. The study began in the

year 1976 and 1,21,700 female nursing staff within the ages 30 to 55 years, living in USA were asked to answer health questionnaires through mail. In 1986 another study incorporating 51,529 health care professionals aged 40 years to 75 years was started. They responded to questionnaires sent to them via mail,which included questions of medical history, daily regimes and daily diet intake. Every 2 years, both the study groups were sent follow-up questionnaires to know about any changes in lifestyle or dietary patterns and any new medical conditions. The exclusion criteria were any incomplete questionnaires or any persons having very high or very low-calorie intake. The food frequency questionnaire was created to enable collection and evaluation of average food consumption data for the past one year. Data from the two studies was clubbed together and adjustments made for age, sex, smoking status, energy intake, body mass index, physical exercise and number of physician visits. Extensive adjustments were made for smokers as it is the one major risk factor for COPD. More over, smokers tend to have a wider variety of eating habits than non smokers. Due to its anti-oxidative and anti-inflammatory capabilities, the results of two trials showed that a high intake of fibre, specially from cereals and whole grains, was inversely proportional to the development of COPD.

A cross-sectional survey on people was conducted through NHANES (The National Health and Nutrition Examination Surveys) to examine the correlation between fibre intake through diet and lung function (Hanson et al., 2016). The survey started with the hypothesis that a low fibre intake reduced overall lung function. The participants included in the study were US citizens in the age group of 49-70 who already had a bronchodilator spirometry measurement result with them. Dietary intake was determined by 24 hour recall method through interviews. BMI and total diet intake along with total fibre intake per daywas calculated in grams. Fibre supplements were not taken into account. Smoking status was classified into never, former and current smokers. Owing to the fact that smoking being the single major risk factor in deterioration of lung function, an analysis of the relationship between fibre intake and smoking status, was also done. From the survey it was concluded that the subjects who were consuming high fibre foods such as fruits, vegetables and whole grains, not only had a lower BMI but also better lung function as indicated by spirometry test. Low fibre intake was also seen in smokers. Considerable correlation was found connecting dietary fibre to lung function in both univariate and multivariate models. Also, the beneficial

effects of high dietary fibre intake were not influenced by intake of any other nutrient (antioxidants) or food item like cured meat.

A prospective cohort study on women was conducted to establish the connection between fibre intake for long periods, both specific and total fibre intake were taken into account, in correlation with the incidence of chronic obstructive pulmonary disease. Between 1987 and 1990, from central Sweden all women were invited for mammography screening and to fill up a food frequency questionnaire. These women were the part of SMC (Swedish Mammography Cohort) and the original cohort consisted of 61433 subjects (Harris et al., 2013).

After 10 years in 1997, another questionnaire was sent with a follow up of the same done between 2002 and 2014, giving a lag period of 4 years. Food frequency questionnaire was used to assess the total and specific fibre intake through dietary sources. The results were found consistent with earlier studies and it was corroborated that women in the top fifth sub set of total fibre intake, were at 30% lesser risk of developing COPD as compared to those in the lowest quintile. For specific fibre intake a negative ecorrelation was established between COPD and long-term intake of fruits and cereals. It wa salso observed that risk reduced for all categories of smoking status with every gram increase in fibre in take. Findings also established the inverse relation was stronger with higher consumption of cereal fibre. The investigators also stated that dietary fibre played a role in regulating immune system through gut-liver-lung connection. Fibre also has an impact on the gut microbiota which in turn could be linked to the fermentation of fibre in the gastrointestinal tract by microbes to short chain fatty acids, which have been shown to improve immune system's response. It is also possible that dietary fibre may help in reducing the oxidative stress in the lungs due to it's antioxidant property (Harris et al., 2013).

In Netherland a trial was conducted on 80 COPD patients which revealed a positive link between high intake of poly unsaturated fatty acids supplementation and significant raise in exercise capacity. A study was carried out to see the association between omega -3 fatty acids in diet on subjects who were current and former smokers. The subjects were asked to answer questionnaires both for dietary intake with emphasis on fatty acid and respiratory symptoms. Spirometry was also done to assess the stage of COPD. Similar results were seen that increased intake of omega-3fatty acids resulted in lowering COPD morbidity (less number of severe exacerbations, reduction in respiratory symptoms and better quality of life). It was concluded that increased in take of omega-3 fatty acids by cigarette smokers,

may be protective against COPD. Macrophage-clearing function was seen to be enhanced by increasing the intake of omega-3 PUFAs , resulting in actively resolving inflammation in the lungs (Lemoine et al., 2020).

One of the study, done over a period of 14 years, to determine the association of obesity and COPD and their combined effects on health. From the Canadian National Heath Survey (1994- 2007), data of 65000 subjects were used. Self-reported measures for height in meter square and weight in kilograms were used to calculate body mass index (BMI= kg/m_2) and identify the presence of obesity, a positive correlation was found between Obesity, BMI and COPD (Vozoris et al., 2012). The prevalence of other metabolic diseases was also found to be high in COPD patients compared with non-COPD patients. 18% of the patients with COPD in this study had obesity and as the prevalence of obesity decreased the lung function tests also improved (Hanson et al., 2014).

In another study, conducted on 38 patients and 34 control subjects with COPD, about 47% patients and 21% control subjects showed 3 or more than 3 symptoms associated with metabolic syndrome. Those subjects were inducted who had 3 or more features of metabolic syndrome, namely abdominal obesity, atherogenic dyslipidemia, insulin resistance and high blood pressure. Most patients of COPD had shown more than 3 features of the metabolic syndrome (Marquis et al., 2005).

Along with other factors body mass composition has also been seen playing an important role for the development of COPD. In a study , higher lean-to-fat ratio found in women, was seen to be related to better Short Physical Performance Battery Score.The build-up of higher fat mass was more strongly related to decreased lung function. This body composition study was done on a cohort of 355 young adults. It was concluded that body mass composition was an important non-pulmonary factor that affected increase of functional restrictions associated with COPD (Mark et al., 2007).

In another study, systemic inflammation and physical inactivity were also found to be associated with both COPD and chronic bronchitis, they studied 30 patients having chronic bronchitis and 170 suffering from COPD with varying severity. The frequencies of the metabolic syndrome in patients with chronic bronchitis were 53% and for GOLD stages I, II, III, and IV, 50%, 53%, 37% and 44% respectively with an average of 47.5% (Watz et al., 2009).

In a study 41414 ex-smokers, enlisted at the university Hospital of Leuven (Belgium), aged above 50 year were studied for assessment of the link between vitamin D status and the presence of COPD. Serum levels of 25-hydroxyvitamin D were measured. A positive correlation between prevalence of vitamin D deficiency, presence and severity of COPD was established. It was therefore concluded that the patients with severe COPD should have a higher intake of vitamin D. However, in another study, done (Shaheen et al., 2011) on women and men of ages between 59 to 73 belonging to Hertfordshire Cohort Study in UK, the results did not confirm a positive relationship between COPD and blood levels of 25-hydroxyl vitamin D (Janssens et al., 2010).

A study was done to assess the relationship between polymorphism of Glutamate-Cysteine Ligase Genes (GCLG), loss of lung function due to smoking and effect of vitamin C intake, in Dutch populace. The study was done in 2007 to see the genetic effects on lung function level and decline were estimated. It was concluded that smoking along with reduced vitamin C intake increased the burden of body's oxidative stress, which in turn can make the gene GCLG susceptible to decreasing lung function below normal (Siedlinski et al., 2008).

Dietary antioxidants have been believed to prevent oxidative damage of the lung tissue, caused by cigarette smoking (Hong et al., 2018). 21,148 (8804 men and 12 344 women) Korean adults were the samples and their details about lung function, co morbidities, nutritional status, health and demographic features were taken from Korean National Health and Nutrition Examination Surve (KNHANES 2007–2014). Data was collected through health questionnaires, nutrition and screening surveys. These were further classified into 4 groups based on smoking status, gender and age. The study concluded that antioxidant vitamins have a beneficial effect on the lung function. The beneficial effects, however fluctuated by gender and smoking status (Shahar et al., 1994).

In a survey, done in 2002, the correlation between lung function and antioxidant intake through diet was studies for 10 years. The participants were recruited from 3 European countries known as the European Community Respiratory Health Survey (ECRHS), namely, Germany, UK and Norway. A total of 680 subjects were included having mean age 43.8±6.6 years. On analysis it was found that fruit and tomato intake, both of these being rich sources of antioxidants, was associated with slower decline in FVC. The study concluded that intake of antioxidant rich foods such as fruits and tomatoes might help in the delay of lung function decline, especially for non-smokers. It was more prominent in people who consumed

tomatoes (Garcia et al., 2017). Vitamin C, a well-known antioxidant, has been used to treat COPD patients because they shield the lungs from the delirious effects of different oxidants and /or reactive oxygen. Antioxidant acts as first line of defense towards oxidants (Rahman et al., 2006).

Popular natural supplement ascorbic acid (vitamin C) functions as an antioxidant by maintaining the reduced state of both short-lived oxidants like O_2·–and nitric oxide as well as long-lived oxidants like semiquinone radicals (Kanani et al., 2012). Our objective is to evaluate how vitamin C supplementation for COPD patients affects their clinical therapeutic outcomes. According to the research, vitamin C consumption and adult lung function are positively correlated (Liu et al., 2010) .

Other studies have also indicated the positive correlation between antioxidants such as vitamin A,C, D, E, α and β carotene with lung function. In one such review study the symptoms, exacerbation and pulmonary function improved with increased intake of these vitamins and hospitalization rate decreased (Ioanna et al., 2010).

In this study, one of the causative factor for heterogeneous disease COPD found to be the interaction of genetic susceptibility and environmental influences, affecting the defense against oxidative stress and inflammation. Inherited Alfa 1 Antitrypsin deficiency and early development of emphysema, leading to COPD, proves that genetic factors may be acting as key determinant in anti proteases balance. It showed strong bonding between genetics and environmental factors which leads to destructive changes as loss of elastic recoil in lungs due to the variations caused in protease anti-protease systems (Wood et al., 2006).

The study was undertaken to investigate the hypothesis that there would be a co-relation in blood group and the chances of developing COPD. As chronic respiratory diseases are determined by various variables like genetic predisposition, socio economic, environmental factors etc. One such genetic factor in developing COPD can be the ABO blood group system (Mroczek et al., 2018).

Positive results were seen in a study conducted on 228 coal mine workers to assess the role of blood group ABO, salivary ABH secretor status and Lewis system on lung function, asthma and wheezing. Subjects with lewis positive and salivary ABH secretor were found to

be with better lung functions as compared to negative once. Lung function capacity is better in blood group O subjects than A, B and AB blood groups (Kauffmann et al., 2006).

In 2021, a study was conducted with the aim to determine the distribution of ABO blood group in COPD patient and disease stages as compared to general population. After statistical analysis a significant differences was obtained in COPD and its stages in the distribution of ABO blood types . COPD cases were at the top most segment with blood type A and severe stage of disease. Similarly type B were more common in chronic obstructive pulmonary disease as compared to blood type O, (23.3%). Percentage of type AB are higher than expected in COPD cases (Petricevicblazenkaet al., 2021).

In a survey, data was collected through ECRHS, an international study centre on respiratory disease. Random samples of 9511 young adults were collected in the year 1991 till 1993 from the general population. The data was collected through questionnaire and a detailed clinical examination was done along with spirometry for selected subjects. In stage 2 of the study (1992-2002), out of 9511, 6019 subjects (75%) attended the survey. After applying all exclusion criteria, the cohort consisted of 4636 subjects. It was found that at the baseline or upon follow-up, respiratory infection in childhood and a family history of asthma, increases the risk of developing COPD considerably. The Major finding, however was that cigarette smoking is the main cause of COPD in young adults. In this study cohort, three out of four new COPD cases were those of smokers and the potential risk of development of COPD was almost double in tobacco smokers as compared to non-smokers. Also, through this study it came to be understood that male gender, underweight people and subject older than 40 years of age, were at a significantly increased risk of developing the disease. It was therefore concluded, that cigarette (tobacco) smoking was the major single risk factor in the development of COPD. Along with this, family history of asthma and childhood respiratory infection also played a vital role (Roberto et al., 2010).

A survey conducted in Korea between 2005 and 2015 analyzed the role of aging and smoking on the development of disease. 1427 patients were selected and their status of smoking and occurrence of COPD was evaluated from the data available at Korea National Health and Nutrition Examination Survey (KNHANES). It was found that severity of COPD in smokers increase with age. Clinically smoking was also ascribed as a factor accelerating the ageing process. This is due to in part be associated with reduced lung function in people between the ages of 30 and above. Age related physical manifestations and changes were found to be more profound in smokers and COPD patients. They were identified at higher levels of risk. The gender-based difference was not found in this study (Kim et al., 2019).

From the above literature review it was seen that both nutritional and socio-demographic parameters act as major risk factors in the development of COPD. Cigarette (tobacco) smoking came out as a major single risk factor for development and aggravation of symptoms. It was found that smoking accelerated aging, reduces lung function and thus, increasing the severity of the COPD. Other factor that emerged in literature evidence was diet. To a major extent, a diet low in total fibre and ω-3 fatty acids contributed to the dangers of COPD development. Dietary antioxidants, vitamin E and C, were also found to prevent damage due to oxidation of the lung tissue, caused by cigarette smoking. Smoking along with reduced vitamin C intake increased the burden of body's oxidative stress, which in turn can make the gene GCLG (glutamate-cysteine ligase gene) susceptible to decreasing lung function below normal (Dickinson et al., 2004). Through the studies antioxidant vitamins were found to have a favorable effect on the functioning of the lungs, this effect, however fluctuated by gender and smoking status. Further, a positive correlation between prevalence of vitamin D deficiency, presence and severity of COPD has also been seen in some studies. Thus, a diet high in vitamin D is to be recommended along with fibre, vitamin C, vitamin E and omega-3 fatty acids in COPD cases. Some other underlying parameters observed in literature findings as determinants in COPD included male gender, age (40+), early childhood respiratory diseases, family history of asthma and BMI. Obesity was also found to be associated with COPD as it is directly related to BMI of a person. Obesity is a complex metabolic condition which effects the structure and functioning of many organ systems in the body. The fatty tissue is also believed to be a source of chemical mediators that increase systemic inflammation, which is the main feature of COPD. Along with systemic inflammation, physical inactivity was also found to be associated positively with COPD.

It is with this background that the present study is designed to understand and explore the role of physiological, pathological, genetic, dietary and lifestyle factors in patients with COPD. The aim of the present research is to determine whether socio-demographic and nutritional factors act as significant determinants and correlates in the functional outcomes of COPD.

3. DESCRIPTION OF BROAD AREA

Many national and international guidelines focusing on socio-demographic and nutritional factors associated with COPD have been published in academic literature. The concern for patients suffering from COPD has been toward prevention and management along with diagnosis and treatment. Among management of cases of COPD, the primary focus is on dietary factors and lifestyle interventions. Several questions related to demography, dietary and genetic factors have been posed to understand the occurrence and management of cases suffering from COPD. Some of these questions include:

i) What dietary factors contribute to or ameliorate the disease symptoms ?

ii) What is the role of macronutrients (Carbohydrates, Proteins, Fats), Vitamin C and Fibre in management of COPD cases ?

iii) How is COPD related to demographic factors and BMI ?

iv) To what extent childhood respiratory infections impact the occurrence and severity of COPD in adults?

v) Is there a high association between family history of COPD and occurrence of the disease in the next generation ?

vi) Is there a high association between smoking status and COPD?

These questions are pertinent because a better understanding of epidemiology, development and course of the disease will lead to an early diagnosis and a better prevention and management of cases.

4. AIM AND OBJECTIVES OF THE STUDY

The aim of this study is to assess the Association of Socio-Demographic and Nutritional factors with Chronic Obstructive Pulmonary Disease in Delhi NCR region.

4.1 To explore the demographic profile of diagnosed COPD cases from hospitals of Delhi NCR region.

4.2 To estimate the extent of respiratory symptoms and the severity of airflow obstruction in diagnosed COPD cases as per the GOLD standards.

4.3 To asses the food intake and diet pattern of the COPD patients.

4.4 To study the association of demographic factors, Body Mass Index and smoking habits on COPD cases.

4.5 To study the association of carbohydrates, protein, fats, vitamin C and fibres with COPD.

4.6 To study the association of COPD with history of childhood respiratory infections and hereditary of respiratory disorders.

5. METHODOLOGY

5.1 SETTINGS

The study will be conducted in Medicine and Pulmonary (Chest Medicine) Department of Hospitals at Delhi NCR location.

5.2 RESEARCH DESIGN

A cross-sectional prospective exploratory study design will be followed to determine the Association of Socio-Demographic and Nutritional factors with COPD. The cross- sectional design helps in evaluating diverse parameters experienced by study cases at a single point in time. The exploratory study will describe the phenomena of study and examine the relationships among study parameters.

5.3 PARTICIPANTS

Diagnosed cases of COPD as per the GOLD guidelines will be screened and included in the study. The inclusion and exclusion criteria are reported below.

5.4 INCLUSION CRITERIA

i) Cases of age group between 40 to 85 years.

ii) Both males and females will be taken as cases.

iii) Clinically diagnosed patients of COPD as per GOLD standards will be considered as cases.

5.5 EXCLUSION CRITERIA

i) Pulmonary Tuberculosis.

ii) Chronic Kidney Disease on maintenance hemodialysis.

iii)Lung carcinoma.

iv)Samples below 40 or above 85 years.

5.6 SAMPLING AND SAMPLE SIZE

Purposive non-probability sampling method will be followed to screen the cases and include them in the research study. The proposed sample size (Calculated by using calculator software with Confidence level 95%, Margin of error 5%) were taken for the study.

5.7 MEASURES

A survey questionnaire comprising of demography sheet, categories of severity of airflow limitation, extent and magnitude of patient's symptoms, past and family history (hereditary) of respiratory disorders, BMI index, tobacco smoke and nutritional status will be designed for this study. The survey questionnaire will include following assessment tools.

i) Socio-demography Sheet: Including age, gender, socioeconomic status, living status, working status etc.

ii) Classification of COPD severity as per spirometric cut points.

iii) COPD Assessment Test.

iv) Nutritional Parameter Questionnaire: 24-hour dietary recall Questionnaire etc.

v) For other factors a questionnaire sheet will be use for assessing BMI status, smoking status, past medical and family history of respiratory infections and disorders.

5.8 STATISTICAL ANALYSIS

The quantitative and qualitative data will be analysed by using appropriate statistical methods and tools. A p-value of .05 will be considered statistically significant for reporting the findings.

6. EXPECTED OUTCOME OF RESEARCH

The present study aims to explore the role of Association of Socio-Demographic and Nutritional factors that play a key role in frequency and severity of COPD symptoms. The study will have an array of outcomes that may serve as guidelines for preventing and managing COPD cases.

i) With respect to socio demographic variables, the study expects that aging, male gender predominance, low socioeconomic status and rural population will emerge as significant determinants of disease. Airflow obstruction severity as per spirometric cut-points will be more in these strata when compared to their counterparts. Further, symptom assessment based on CAT (COPD Assessment Test) will be higher in these cohorts in contrast to their respective cohorts.

ii) The findings of the study will provide a relation between dietary factors with frequency and severity of COPD symptoms and spirometric findings. The study proposes a protective impact of fruits, dietary fiber, vitamin C and moderate intake of proteins on COPD. The role of carbohydrates and fat intake on COPD symptoms is an open research question to be investigated in the findings.

iii) The findings of the study will establish a relation between socio-demographic and nutritional factors with frequency and severity of COPD symptoms and spirometric findings. The magnitude and intensity of disease will be more in patients with low and high BMI, excess tobacco intake. Further, the occurrence and severity of disease will be greater in patients with past or childhood history and family (hereditary) history of respiratory disorders.

The study will have a significant impact on future research in epidemiology and COPD management. Findings of research will identify and establish significant risk parameters associated with COPD development. On the basis of identified determinants of COPD, an early intervention plan can be designed to reduce the burden of COPD in community. These

plans may include pulmonary rehabilitation therapies, nutritional supplementation, self management interventions and integrative care plan for COPD patients. The aim of such programs will be to relieve symptoms, prevent disease progression, reduce risk factor exposure and improve the overall health status and quality of life of COPD patients.

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ASSOCIATION OF SOCIO-DEMOGRAPHIC AND NUTRITIONAL FACTORS ASSOCIATED WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

SHORT SYNOPSIS

by

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ABSTRACT

The present study aims to assess the Association of Socio-Demographic and Nutritional factors with Chronic Obstructive Pulmonary Disease (COPD) in Delhi NCR region. A cross-sectional prospective exploratory study design will be used to determine whether socio-demographic factors like age ,sex ,socio-economic status, BMI, family history and nutritional factors-carbohydrates, protein, fat, fibre and vitamin C act as significant determinants and correlates in the functional outcomes of COPD. A survey questionnaire comprising of battery of assessment tools will be administered to the selected sample

based on pre-determined inclusion and exclusion criteria. The data collected will be evaluated by using appropriate statistical tools. The study will have an array of outcomes that may serve as guidelines for preventing and managing COPD and thus, improving the overall health status and quality of life of COPD patients.

Key words: Chronic Obstructive Pulmonary Disease, Lifestyle factors, Smoking, Fibre, Body Mass Index.

ASSOCIATION OF SOCIO-DEMOGRAPHIC AND NUTRITIONAL FACTORS ASSOCIATED WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

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